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PROCEEDINGS
OF
THE ROYAL SOCIETY.

1833-1834.

No. 17.

May 15, 1834.

MARK ISAMBARD BRUNEL, Esq., Vice-President, in the Chair.

A paper was read, entitled, "Of the Functions of some parts of the Brain ; and of the relations between the Brain and Nerves of Motion and Sensation." By Sir Charles Bell, K.H., F.R.S.

The author commences his paper by an enumeration of some of the sources of difficulty and of error which have impeded the progress of discovery in the physiology of the brain ; the first impediment to which, he observes, "is in the nature of the inquiry, since extraordinary and contradictory results must be expected from experimenting on an organ so fine as that must be which ministers to sensibility and motion, and which is subject to change on every impression conveyed through the senses." Another cause of fallacy is the dependence of the brain on the condition of the circulation within it : but the most frequent source of error is the obscurity which hangs over the whole subject ; for although the brain be divided naturally into distinct masses, not one of these grand divisions has yet been distinguished by its functions ; and hence we may account for the failure of all attempts to explain the phenomena which attend injury of the brain. The principle, now universally admitted, that nerves have distinct functions, and not a common quality, is pursued by the author in his investigation of the structure of the brain, in which he follows the nerves into that organ, and observes the tracts of nervous matter from which they take their origin. He concludes from his inquiries that both sensibility and motion belong to the cerebrum ; that two columns descend from each hemisphere ; that one of these, the anterior, gives origin to the anterior roots of the spinal nerves, and is dedicated to voluntary motion ; and that the other, which from its internal position is less known, gives origin to the posterior roots of the spinal nerves, and to the sensitive root of the fifth nerve, and is the column for sensation. He further shows that the columns for motion, which come from different sides of the cerebrum, join and decussate in the medulla oblongata ; that the columns of sensation also join and decussate in the medulla oblongata ; and lastly, that these anterior and posterior columns bear, in every circumstance, a very close resemblance to one another, in as much as the sensorial expansions of both are widely extended in the hemispheres ; for they pass through similar bodies towards the base of the brain, and both

concentrate and decussate in the same manner ; thus agreeing in every respect, except in the nervous filaments to which they give origin. Hence he explains the phenomena of the loss of sensibility as well as the power of motion of one side of the body, consequent on injuries of the other side of the brain.

The Society then adjourned over Whitsun Week to the 29th of May.

May 29, 1834.

JOHN WILLIAM LUBBOCK, Esq., M.A., V.P. and Treasurer,
in the Chair.

A paper was read, entitled, "On the Principle of Construction and General Application of the Negative Achromatic Lens to Telescopes and Eyepieces of every description." By Peter Barlow, Esq., F.R.S.

This paper is intended as a more full illustration of the principles on which the negative achromatic lens is constructed and applied, than has been given in the extract from the author's letter to Mr. Dollond, contained in the paper of the latter, lately read to the Society, on his ingenious application of that lens to the micrometer eyepiece. The author shows that its advantages are not confined to this instrument, but that it is applicable to any eyepiece positive or negative to the erecting eyepiece, and, indeed, to any telescope of fluid or glass, and also to refractors.

A paper was also read, entitled, "Some remarks in reply to Dr. Daubeny's Note on the Air disengaged from the Sea over the site of the recent Volcano in the Mediterranean." By John Davy, M.D., F.R.S. Assistant Inspector of Army Hospitals.

Respecting the air in question, which Dr. Davy had found to consist of about 80 per cent. of azote and 10 oxygen, he had remarked that two views might be taken of its origin ; the one, that it was of volcanic source ; the other, that it was derived from the sea water, and merely disengaged by the heat of the volcano. Dr. Davy, rejecting the former of these views, had adopted the latter, for reasons, the validity of which was controverted by Dr. Daubeny ; and the purpose of the present paper is to answer the objections urged against them, and to bring additional evidence in support of his opinion.

A paper was then read, entitled, "On the number of Primitive Colorific Rays into which White Light may be separated." By Paul Cooper, Esq. Communicated by J. G. Children, Esq. Sec. R.S.

From a consideration of the circumstances in which white light is decomposed by the prism, in different experiments, and of the various appearances of the spectra which result, the author is led to the opinion that the primary colours composing white light are not seven, as conceived by Newton ; nor four, as supposed by Wollaston ; but only three : and that these three are not red, yellow, and